

Pleistocene Archaeological Remains from South China

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UNTIL 1949 *in situ* archaeological remains in South China were limited to a few cave sites. In general the known lithic materials were most similar to Southeast Asian Hoabinhian industries, associated with abundant shellfish remains, some game, and crude ceramics, and traditionally assigned no great antiquity by archaeologists. In fact, most cave deposits in South China were destroyed entirely as a result of the long-standing peasant tradition of living in the limestone caves and digging their fossiliferous deposits for bones and teeth to be sold to drugstores as medicines. That this situation has been incredibly destructive of both cultural and biological information is clearly underscored by post-1949 reconnaissances which show that where traces of cave fill remain, archaeological and faunal materials are often encountered. Despite the encouraging advances in archaeological information which are reviewed here, it must be noted that materials from unequivocal pre-Recent contexts are not and probably will not be numerous in the future, unless new fieldwork is directed explicitly toward revealing hitherto untouched cave localities and open-air stations.

In South China during the last two decades several upper pleistocene and middle pleistocene localities with either hominid fossils or flake assemblages have been found that permit us to begin to outline some of the culture history of the region. Furthermore, it has become increasingly apparent that our traditional view of the Hoabinhian has been far too conservative in terms not only of its temporal placement but also the level of cultural complexity actually attendant. For example, we now have upper pleistocene dating on Japanese ceramics (Kotani 1969) which almost surely derive from the mainland and south, and evidence for terminal pleistocene experimentation with cultigens in Southeast Asia (Chang 1968, Gorman 1969, Solheim 1970), both of which demand substantial revision in our reconstructions of culture history for the area. No longer can the region be considered and

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dismissed simply as the backward and marginal recipient of ideas from external centers.

It is against this background—a revised chronological framework and new information on cultural events in Southeast Asia—that this summary of South Chinese archaeological remains is set. In the discussion of the cultural and human paleontological remains which follows, the bias is toward the elucidation of the new finds and those most securely attributable to the Pleistocene. Materials commonly considered “mesolithic” or typologically “neolithic” and hence Recent (see Chang 1968) are generally excluded despite remarks that some may indeed be earlier, because there is no way at present to provide confirmation of their pleistocene age.

Relevant localities are discussed by province, beginning with Yunnan in the southwest and covering the southern coastal provinces, then again from west to east, beginning with Szechuan in the northwest of South China. This preserves to a large extent treatment by natural geographic regions, which would be a more satisfying approach to the materials if they were moderately well represented subareally. Unfortunately they are not.

No discussion is presented here of the thirty-five or so faunal collections which when seriated provide a relative and partially absolute dating scheme; the reader is referred to works by Kahlke (1961) and Aigner (1969; n.d.) for fuller information and references.

Cultural materials described in the Chinese literature are selected examples that often lack archaeologic congruity. The categories, which for the most part are descriptive and nonfunctional, have been retained. For the reasons I have cited, no attempt is made in this paper to formulate a new descriptive typology or terminology or to suggest activity-specific locations based upon artifact associations. Reference is made to pertinent materials from adjacent regions, principally in Southeast Asia, but owing to the fact that the South Chinese remains are themselves anthropologically unsatisfactory and only superficially known, any interregional comparisons are premature at best (Table 2).

Hominid fossils are treated in the same body as the artifacts but are recapitulated by temporal sequence of relative morphological age (Table 3). The value of the human fossils from China cannot be overemphasized. They provide the best known, longest, and most complete regional morphological sequence of forms in the world—particularly when we include the Mosbachium-equivalent Lantian cranium and Holstein-equivalent Choukoutien 1 series (Aigner 1972, Aigner and Laughlin 1972). All the Chinese fossils display traits that scholars such as Weidenreich, Coon, Thoma, and Laughlin view as clearly Mongoloid. (For a concise theoretical discussion of the evolutionary significance of the earlier Chinese hominid remains, the reader is referred to Aigner and Laughlin 1972.)

In the following summaries of South China localities, the standardized transliterations of personal names may vary from those which occur in other journals. For example, P’ei elsewhere appears as Pei, Chou as Chow, Pien as Bien. An exception is Woo Ju-kang, whose work has always appeared in the West under Woo, not Wu. Names of districts, municipalities, (autonomous) regions, and hsien are standardized after the *Communist China Administrative Atlas* (C.I.A., March 1969).

CULTURAL AND HOMINID LOCALITIES

Yunnan Province

1. *Pap'an River terrace stations (Fig. 1.1: lat 24° 40' N, long 103° 20' E)*

Only a few localities of possible pleistocene age have been reported in Yunnan. P'ei and Chou (1961) located three collecting stations in Panch'iao Commune near Lunan, Ch'ü-ching, I-liang District. The original report identified the sites as being

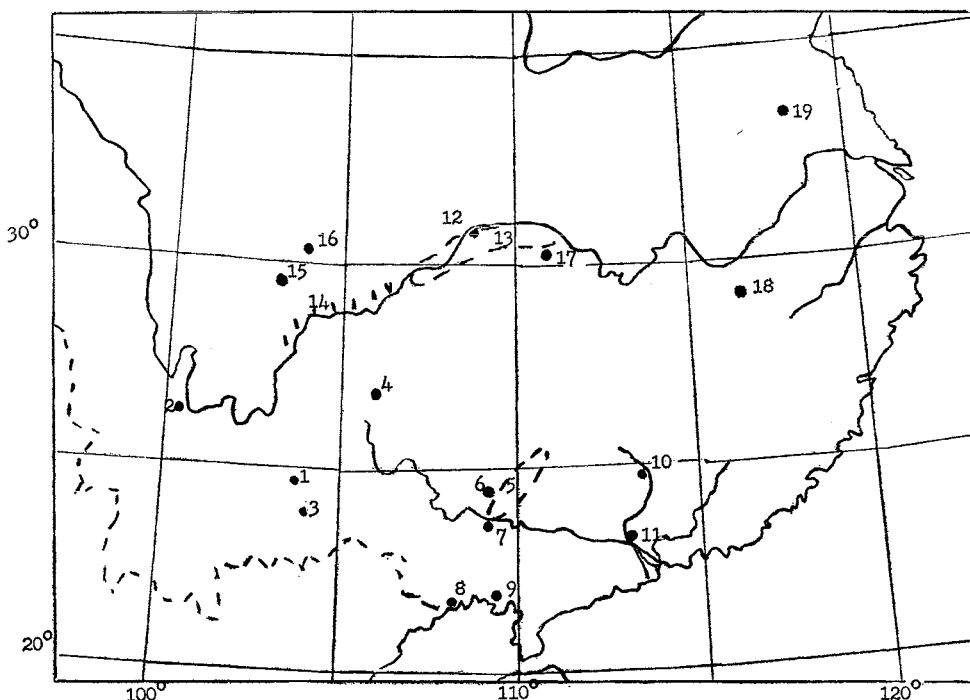


Fig. 1 Pleistocene hominid fossils and cultural remains from South China. Locations as follows:

Yunnan: 1. Pap'an sites near Panch'iao, Lunan, Ch'ü-ching District; 2. locality 6003 near Lichiang, Li-chiang District; 3. Ch'uipei rock-shelter (Heichinglung), Wen-shan Chuang-Miao Region.

Kweichow: 4. Ch'ienhsi, Pi-chieh District.

Kwangsi: 5. caves between Laipin, Liu-chou District, and Hsingan, Kuei-lin District; 6. Liukiang=Liuchiang, Liu-chou District; 7. Laipin (Chilinshan), Liu-chou District; 8. Yapushan and Malangchi, Tunghsing, Ch'in-chou District; 9. Lingshan, eastern Ch'in-chou District.

Kwangtung: 10. Mapa, Ch'uchiang, Shao-kuan District; 11. Hsich'iaoshan, Nanhai, Fo-shan District.

Szechuan: 12. Yenchingkou, Wanhsien, Wan-hsien District; 13. between Ich'ang, I'ch'ang District and Chungking, Ch'ung-ching Municipality; 14. stations from Ch'ung-ch'ing west on the terraces of the Yangtze, Min, and Yalun; 15. Fulin=Hanyüan, Ya-an District; 16. Tzeyang, Nei-chiang District.

Hupei: 17. Lungtung cave near Hsiachungchiawan, southwest of Ch'angyang, I-chang District.

Kiangsi: 18. Yungshan cave, north of Loping, near the juncture of the boundaries of Shang-jao District and Ching-te-chen Municipality.

Anhui: 19. Hsiaotsaowan, Ssu-hsien District?

on or near the Panch'iao, a tributary of the Nanp'an near Lunan, at an elevation of 1500–2000 m; in fact the commune of Panch'iao is on the Pap'an. Materials were found on the surface of river-terrace deposits. Locality 6102, 1 km west of Shanch'ungts'un, yielded nine flakes off the upper pleistocene terrace of the Pap'an River. From locality 6103, also near Panch'iao Commune, twenty flakes and several cores were found on the second terrace, considered Recent in age. From locality 6101 on the first terrace, flakes and a few tools included a retouched semilunar flake (Fig. 2c) of large size (52×42 mm). P'ei and Chou suggest that the remains from localities 6101 and 6102, off high terraces, may date to the Upper Pleistocene, and that locality 6103 is Holocene in age.

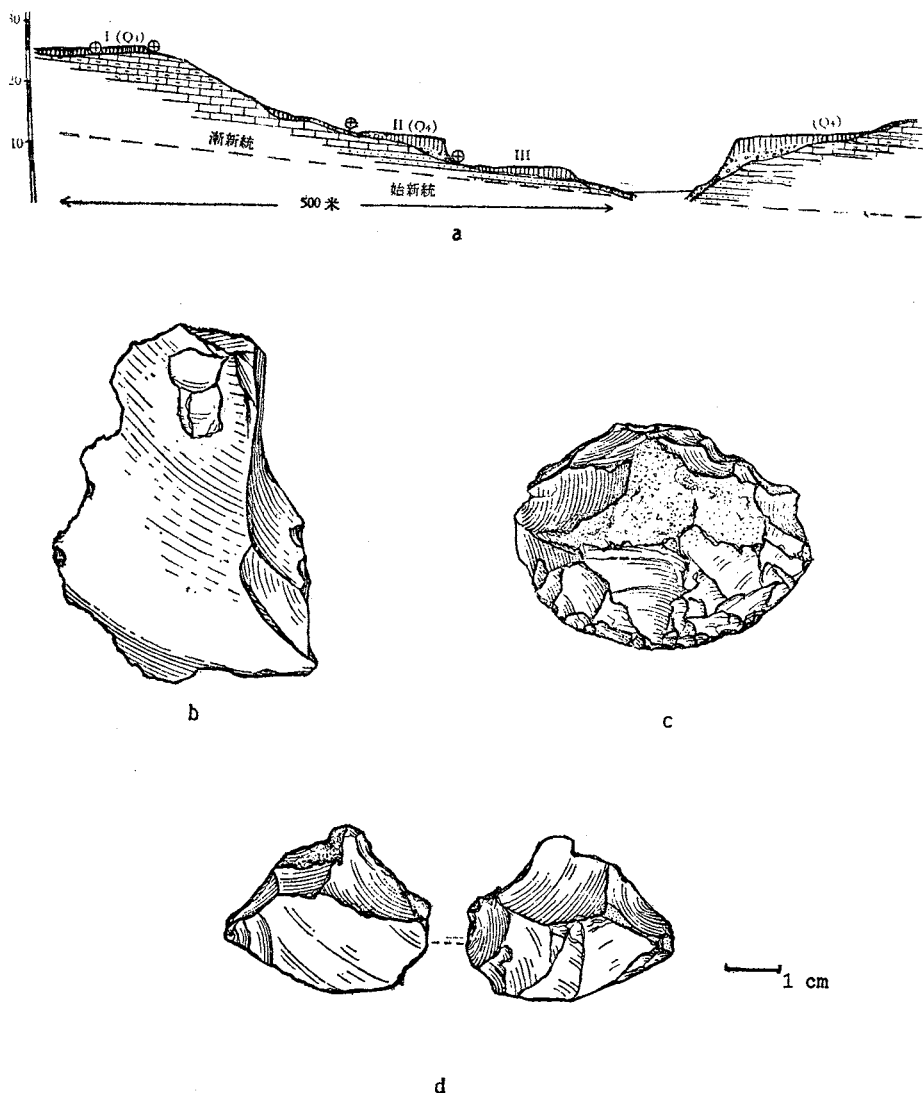


Fig. 2 Pap'an. Source: P'ei and Chou (1961).

In 1961 Li Yen-hsien and Huang (1961, 1962) returned to the Pap'an area and found additional stations on the 40 to 50 m upper terrace and on the second 30 m terrace (Fig. 2). From seven surface localities, including the three found earlier by P'ei and Chou, in excess of ninety flakes, cores, and retouched flakes were gathered, but no pottery fragments or polished artifacts were found in the area of the collecting stations.

The artifacts are mainly of chert and chalcedony with rare pieces of quartz and siliceous sandstone; they are unworn but slightly patinated. The inventory includes seven cores between 4 and 10 cm (maximum dimension) with most between 6 and 8 cm. There is no characteristic core shape. Five make use of a cortex surface as the striking platform while two use a freshly split face. The core angles are generally between 75° and 90° , and the flakes removed are relatively broad but not particularly large.

The largest dimension of each of the seventy-three flakes is less than 7 cm, most being between 5 and 6 cm long. The flakes were apparently produced by removing them from the core with a hammerstone. The angle formed by the platform and face of the detached flake is obtuse; most flakes retain some cortex on the dorsal face. Twelve flakes show traces of use and several have been retouched (Figs. 3, 4). Also present are a "pointed" flake tool (Fig. 3b), several flakes with some marginal retouch, and one extensively retouched high-backed flake. If the collection is dated purely typologically, the age is pre-"mesolithic" (in the sense of Hoabinhian) and could conceivably be Pleistocene, in keeping with the suggested dating of the terrace locations.

2. *Likianghsien = Lichianghsien* (Fig. 1.2: lat $26^\circ 45' N$, long $100^\circ 20' E$)

Li Yiu-heng (1961) studied locality 6003 in northwestern Yunnan's Li-chiang District. The station is on the bank of the Yangchang near Muchiench'iao, less than 10 km from Lichiang, at an elevation of 2800 m. In fluviolacustrine sand and gravel beds considered to be Upper Pleistocene in age, Li found fossil mammalian remains *in situ* from two levels. The fauna includes *Pseudaxis* sp., *Bubalus* sp., rhinoceros, and three femur fragments of *Homo sapiens*. The author also reports a segment of *Pseudaxis* antler which was drilled through.

3. *Ch'uipei* (Fig. 1.3: lat $24^\circ 5' N$, long $104^\circ 15' E$)

A pebble chopper from the Ch'uipei rock-shelter, Heichinglung, Wen-shan Chuang-Miao Region was reported by M. N. Pien and Chia (1938). The age of the specimen is unknown but considered "late."

Kweichow Province

4. *Ch'ienhsi* (Fig. 1.4: lat $27^\circ 5' N$, long $106^\circ 5' E$)

Recently a cave site of potential importance was located in Ch'ienhsi, Pi-chieh District, 170 km northwest of Kweiyang (P'ei et al. 1965). The fissure of cave locality 64063 is long (80 m) and narrow (2 m), with several deep branches. Locality 1 near the cave mouth revealed stone tools and mammalian remains in a level of sand and gravel 2 m below the surface. Elsewhere in the fissurous cave, tools were found in deposits both nearer the surface and also deeper than Locality 1. The

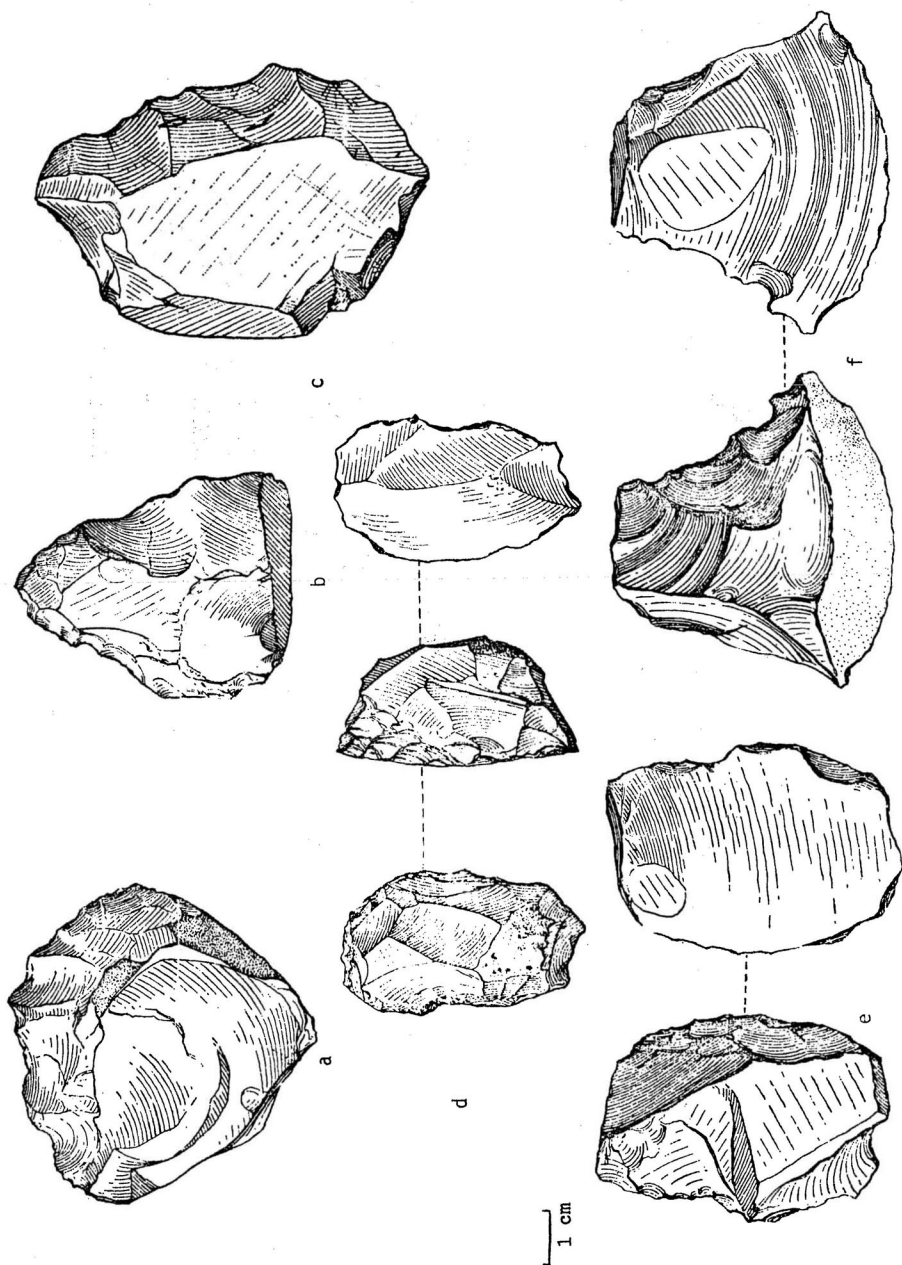


Fig. 3 Pap'an.

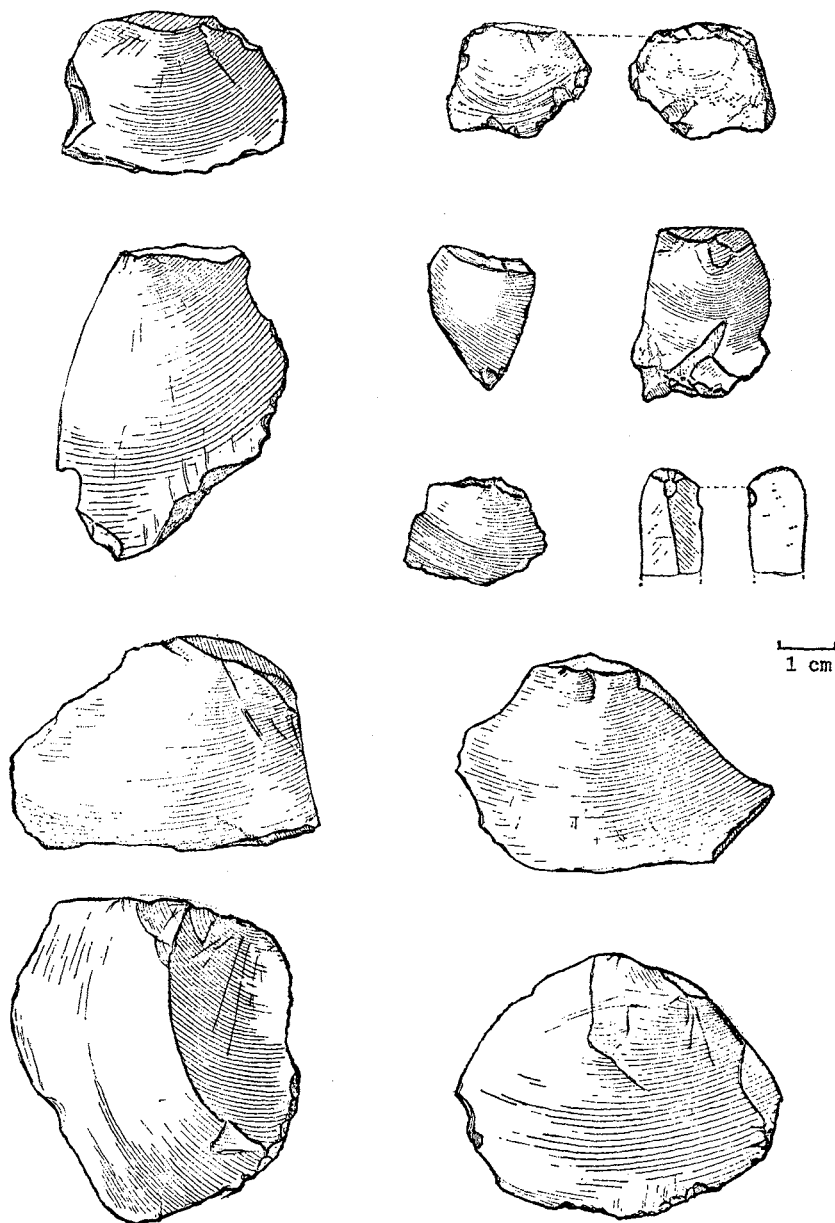


Fig. 4 Pap'an. After Li and Huang (1962).

authors make no overall correlation between the localities. The reported fauna apparently comes from several stations within the cave. The most numerous remains belong to the Ovinae; remains of *Rhinoceros sinensis*, *Megatapirus augustus*, *Stegodon orientalis*, Cervidae, and carnivores are present in that relative frequency. Other forms reported are *Ailuropoda fovealis*, *Hystrix* sp., *Macaca* sp., Bovidae indet, *Sus* sp., and a hyena.

Tools and fauna from the several cuts come from below a thick layer identified

as stalagmitic crust. Because of the presence of the "Stegodon-Ailuropoda" fauna and geomorphological considerations, the age of the deposits is considered Pleistocene. *Rhinoceros sinensis* and *Megatapirus* sp. indicate that a middle or late middle pleistocene dating is reasonable.

The artifacts number slightly more than 100, consisting chiefly of chert flakes and flake tools. The presence of flake assemblages in South China, where pebble tools have been so common in late collections, is of considerable interest. The illustrated examples (Fig. 5) include large, extensively retouched, and fairly regular

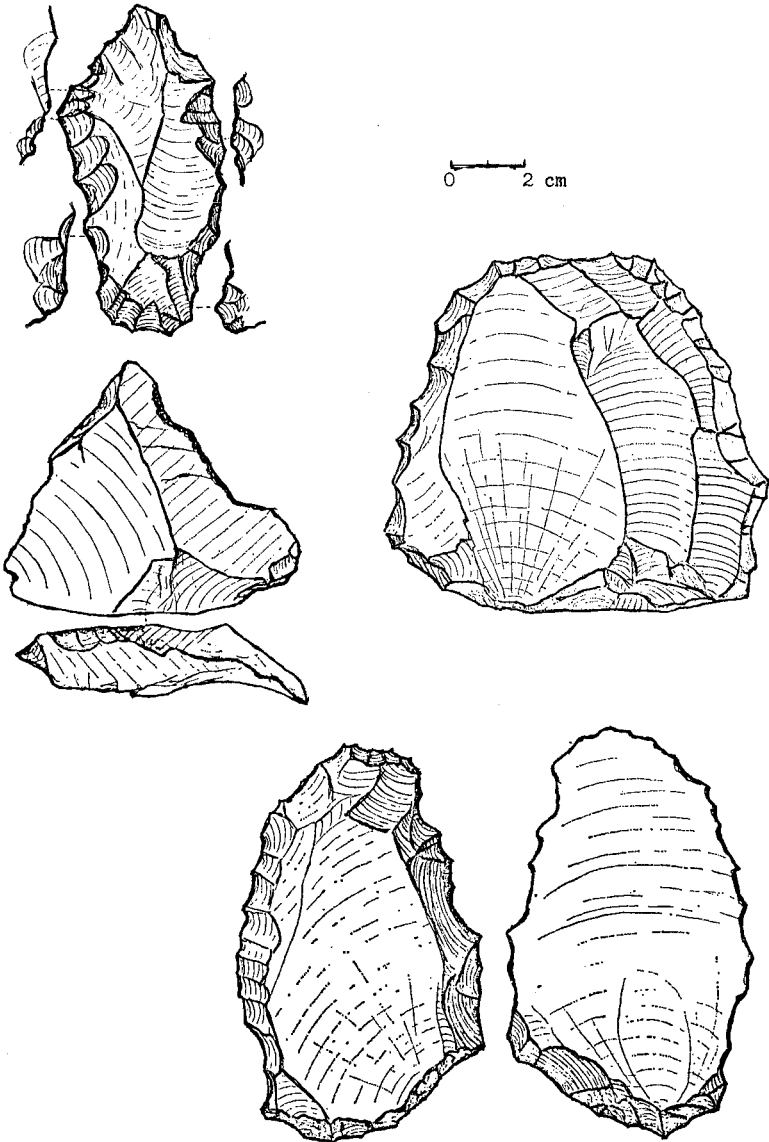


Fig. 5 Chienhsi. After P'ei et al. (1965).

flakes. Edges are reportedly blunted rather than sharp and unsuitable for cutting. The authors consider the primary techniques of tool manufacture distinctive for the area generally and worthy of further study.

Kwangsi Province

5. *Laipin-Hsingan stations (Fig. 1.5: lat 23° 50' – 25° 30' N, long 109° – 110° E)*

Dating of the South China sites is difficult not only because of the faunal continuity and conservatism but also because local excavation for "dragon bones" in Kwangsi has destroyed most cave deposits. Restudy has been possible for a few of the sites first located in the 1930s, but many sites have been entirely destroyed. The Kwangsi cave sites between Laipin, Liu-chou District and Hsingan, Kuei-lin District reported by P'ei (1935*a*, 1935*b*) and others as being of possible "mesolithic" age (e.g., terminal Pleistocene or earliest Holocene) are nearly all associated with polished stone tools and/or pottery, according to Chia and Chiu (1960). However, the general opinion of workers in Southeast Asia is that pottery is present in the latest Pleistocene (Chang 1968, Gorman 1969, Solheim 1967).

In South China, the ceramic site of Hsienjentung in Kiangsi, considered early Holocene according to geological and paleontological evidence (Huang and Chi 1963*b*), may in fact be earlier. In addition, the earliest level at Hsienjentung has several examples of ground stone.

Chia and Chiu revisited five sites near Laipin, Liu-chou District, in the karst region of Kwangsi, which evinced neither potsherds nor ground or polished stone. The stratigraphy is similar to that of ceramic sites with cultural material found in the "gray deposits" overlying the fossiliferous "yellow deposits." Chia and Chiu believe these nonceramic sites may be Pleistocene in age, but investigations in untouched localities are required to clarify the situation.

6. *Liukiang = Liuchiang (Fig. 1.6: lat 24° 20' N, long 109° 20' E)*

In Liukiang, Liu-chou District, some 16 km southeast of Liuchou, workmen in 1958 uncovered a human skull and some postcranial material along with faunal remains from Tungtienyen cave (Woo 1959). The species represented in the collection are *Homo sapiens*, *Ailuropoda melanoleucus*, *Rhinoceros sinensis*, *Stegodon orientalis*, *Megatapirus* sp., *Sus* sp., and *Ursus* sp. The human skull was found embedded in unconsolidated breccia unlike the hard "yellow deposits" characteristic of the cave. The human fossil and a skull of *Ailuropoda* were found in close proximity to each other. Both have reddish material adhering which is not present in the "yellow deposits." The fauna from the "yellow deposits" of the cave is part of the *Stegodon-Ailuropoda* complex of the Middle Pleistocene. Woo concludes that the hominid and panda date later than the rest of the fauna.

The skull is that of a male about 40 years old. It is considered by Woo to be morphologically more primitive than either the Upper Cave or Tzeyerang skulls. (Although Chang [1968] persists in dating the Upper Cave to the Holocene, I prefer my later upper pleistocene dating [Aigner 1969, 1972], which is consistent with Müller-Beck's assessment of the faunal materials [personal communication, 1966] as indicating a possible pre-maximum age.) Many measurements that were taken are within the range for living Mongoloids, but several are in the range for

"Australoids." Besides a well-preserved skull, the remains include the lower four thoracic vertebrae, all five lumbar vertebrae, the sacrum, right innominate, and two femoral fragments.

The skull has fairly large brows and a slightly receding forehead. The bregma is considerably posterior in comparison with modern man. The face is broad and short with correspondingly broad and low orbits. At 143.5° , the naso-malar angle [fmo-n-fmo] is intermediate between those of Mongoloids and Australoids, and the low simatic index (23.9) falls within the range for the latter. Other features are considered by Woo to be Mongoloid in the broadest sense: large and protruding zygomatics, flat and broad nasal bones, moderate alveolar prognathism, and shoveled maxillary incisors. The femur has a thicker wall and narrower medullary canal than in modern man, and according to Woo approaches the Neanderthal condition. Woo concludes that the remains belong to an early form of (modern) *H. sapiens* and to a primitive Mongoloid.

According to Coon's 1963 interpretation of the data reported by Woo, the large and capacious skull is fully modern in the dimensions of its brain case, but its face is low, its nose short and wide, and its orbits low. The palate is moderate in size, as are the teeth. The lateral incisors are shoveled, but the remaining medial incisor is too worn to show this feature. It is of interest that the upper third molars were not cut. This is a trait of high frequency in Mongoloid populations (Aigner and Laughlin 1972) and has recently been reported in the middle pleistocene Lantian 63709 mandible.

Coon notes that although the brow ridges are somewhat heavy for modern Chinese, they are not heavy for peripheral Mongoloids like the American Indians. Primitive features of the skull include the position of the bregma and moderate lambdoid flattening. Coon agrees that the skull represents a Mongoloid form of *Homo sapiens* still in the process of evolution, but would emphasize the Australoid character of the post-cranial remains: short vertebral column, and small and flattish sacrum which is nearly triangular, tapering toward the distal end. This is the only pleistocene hominid said to display any explicitly non-Mongoloid traits.

Thoma (1964) finds the skull morphologically more primitive than Cro-Magnon, believing it to be closest to living Ainu populations and unlike the living Chinese. He, like Coon and Woo, notes certain Australoid features of the material. Based on the descriptions of relative primitiveness of the remains noted by Woo, Coon, and Thoma, a suggested dating between 25,000 and 40,000 years ago is reasonable (Aigner 1969).

7. Laipin (Fig. 1.7: lat $23^\circ 40' N$, long $109^\circ 20' E$)

In 1956 a skull fragment, a maxilla with a few teeth and an isolated upper molar, was found in a cave near Holung, Chilinshan, Laipin, Liu-chou District (Anonymous 1959b). The final report on the remains appeared in 1959 (Chia and Woo 1959). The cave stratigraphy is straightforward. Upper yellowish-gray breccia overlies red loam and is itself divided into three layers by thin "stalagmitic crusts." In the top layer were found the skull base with maxilla and palate, right zygomatic and occipital bones, along with a split pebble, two flakes, and tooth fragments of *Cervus* sp. and *Sus* sp. A large number of molluscan shells were present. The zone also contained diffuse ash and burnt bone.

The human materials are said to belong to an aged male. The palate is high, hence the floor of the sinus maxillaris is lower than the floor of the nose, as in modern man. The nasal floor is even, the lower part of the nasal aperture relatively wide, the canine fossa shallow, and the canine eminence very prominent, although it does not extend upward to the nasal floor. Although the illustrations are not entirely clear, there does not appear to be a palatine torus.

The preserved teeth are strongly worn, and the chewing surfaces of the molars are rectangular rather than square. The authors interpret the fragment of face including the right zygomatic and part of its orbital process as indicating that the skull had no marked anterior projecting malars.

The occipital bone is available for study with the squamous, left condylar, and basilar parts preserved. The lambda-opisthion arc/chord index is 83.5, very near the average for modern man. Lengths of the midsagittal arcs are 70 mm and 51 mm, upper and lower scales, respectively. The external occipital protuberance is medium, the external occipital crest slight, the superior nuchal line a distinctly marked ridge, and the inferior one less distinct. The internal occipital protuberance is in the same level as the external one.

The Chilinshan (Laipin) fossil was the first of pleistocene age to be found in the South China caves. The several Mongoloid features were noted as important by Chia and Woo, who predicted that this fossil and forthcoming ones from South China would shed light upon the origin and early distribution of Mongoloids in eastern Asia.

Briefly, Chia and Woo found that most of the features of the human remains fall into the range for modern *Homo sapiens*. A few, however, do not. Reviewing the data, Coon (1963) states that the interpretation for less malar protrusion than in Mongoloid populations is based on insufficient data. Thoma (1964) believes the remains are morphologically similar to and more advanced than those of Liukiang. He suggests that the fossil's characteristics are closer to those of living Ainu than of modern Chinese, implying, as do Chia and Woo, an ancestral Mongoloid condition. The data provided by the authors suggest that a late upper pleistocene dating is reasonable.

8. Yapushan and Malangchi in Tunghsing (Fig. 1.8: lat 21° 30' N, long 108° E)

Artifacts recovered from Yapushan near Hsichiao, and from Malangchi near Malanchi village (both in Tunghsing, Ch'in-chou District, near the Vietnamese border), consist of pebble "axes" and "choppers" (Anonymous 1960a). The original investigation revealed no ceramics associated with the tools. The modern faunal remains included *Rusa*, two forms of *Bubalus*, and various mollusks in a level below several others which contained shell, ceramics, and polished stone. Evidently restudy of the locale revealed a few potsherds in the pebble-tool level (Anonymous 1960b), and the dating was revised from Pleistocene to early Holocene. The former dating may still be valid.

9. Lingshan (Fig. 1.9: lat 22° 25' N, long 109° 25' E)

W. M. Ku (1962) unearthed human remains in several caves in Lingshan, eastern Ch'in-chou District. His survey indicates that most of the late remains have associated ceramics and therefore are "mesolithic" or "neolithic" in the typological

sense, but a limited collection of human and mammalian remains from a compacted brownish gravel zone in each of three caves was free of sherds. The fauna from Tungshengyen, P'utiyen, and Hungk'utung include *Rhinoceros sinensis*, *Sus scrofa*, *Tapirus*, *Cervicornia*, and *Bovidae*.

The human remains from the first locality include the petrous portion of a temporal, a shoveled upper mesial incisor, an upper molar, and the head and part of the shaft of a right femur. At P'utiyen the remains include three fragments of parietal and two of frontal, including part of an orbit. From Hungk'utung a piece of parietal, half of a patella, an upper molar and two incisors, reportedly from four different individuals, were found. Age may be terminal Pleistocene.

Kwangtung Province

10. *Mapa* (Fig. 1.10: lat 24° 50' N, long 113° 30' E)

From Mapa, Ch'uchiang, Shao-kuan District in northern Kwangtung, a broken human skull was found associated with an apparently middle pleistocene fauna (Woo 1958). A preliminary report on the site appeared in 1959 (Anonymous 1959a, 1959b). The excavated cave is today 25 m above local ground-level, and fossils were found 37.4 m from the cave entrance in a narrow (1–2 m) east-to-west trending fissure (63 m long).

The hominid remains include parts of the parietals, occipital, frontal, and nasals. In addition, faunal remains identified comprise a hyena, *Ursus*, *Ailuropoda*, *Panthera tigris*, Mustelid indet, *Tapirus*, *Rhinoceros*, *Sus*, *Cervus*, *Bos* and other bovids, *Hystrix*, *Lepus*, *Stegodon*, and *Palaeoloxodon namadicus*. The primitive hominid and fauna, including *Stegodon*, suggest a late middle pleistocene dating, though Kahlke (1961) suggests a Wurm-equivalent age.

The detailed study of the Mapa remains was made by Woo and Peng (1959). They believe the skull belonged to a middle-aged male. The supraorbital tori are heavy and project markedly both forward and sideways as a nearly continuous bar; they are thickest near the nose. The frontal squama behind the tori is markedly constricted and the bregma more posterior than in modern man. Calvarial height and bregma position indices, and bregma and frontal angles, are within the range for Neanderthals. On the basis of their measurements and observations, Woo and Peng conclude that the remains belong to a grade of organization similar to that of the European Neanderthals (Woo's early Paleanthropic stage).

Coon agrees with the relative position of the hominid remains but emphasizes that it is not a Neanderthal in the classic sense of the term. He believes Mapa is on the threshold of modern *Homo sapiens* and is "mostly if not entirely Mongoloid." The literature indicates that Mapa is more primitive than Liukiang, that it probably is not much later in time than the last interglacial, and that it is perhaps as early as latest Middle Pleistocene, based upon the presence of *Stegodon*.

11. *Nanhai* (Fig. 1.11: lat 23° 5' N, long 113° 10' E)

At Hsich'iaoshan in Nanhai, Fo-shan District, stone tools were collected off the surface on the slopes of the volcanic hill some 70 km southwest of Canton (Mo 1959, Peng and Wang 1959). Fourteen collecting stations were identified and two were tested. Only surface station no. 2 lacked polished stone implements and potsherds.

The collection from locality 2 consists of forty-six pointed flakes, small pebbles, and sixteen utilized flakes which are described as "scrapers." The latter lack alteration through use or retouch, and the flake shapes are irregular. One perforated stone and ten directed or regular flakes of small size were also collected along with five "core tools" and four "other pebble artifacts." The illustrations are poor, but the almost total lack of secondary chipping on the remains suggests they are detritus. The nature of the remains scattered in the area suggests that this locality also dates from ceramic times and is probably Recent in age.

Szechuan Province

12. *Wanhsien* (Fig. 1.12: lat 30° 50' N, long 108° 20' E)

Until after 1950, there was little work done in Szechuan Province that provided satisfactory evidence on the pleistocene occupation. Since then several localities have been reported that appear to contain pleistocene human or cultural remains.

Very early, Teilhard collected a retouched flake from the surface of a Yangtze terrace (on Itu Loam) 10 km west of Wanhsien, Wan-hsien District, in eastern Szechuan. The terrace is considered to be Upper Pleistocene (Teilhard and Young 1935, Teilhard 1941). From Yenchingkou, also in Wan-hsien District, Hooijer (1951) described a possible utilized antler which he found in an apparently middle pleistocene faunal collection.

13. *Ich'ang to Chungking* (Fig. 1.13: lat 30° 50' – 29° 25' N, long 111° 20' – 106° 30' E)

Between Ich'ang, I-ch'ang District, in western Hupeh, and Chungking, Ch'ung-ch'ing Municipality, in central Szechuan, Edgar collected five artifacts from basal conglomerate deposits of the Itu Loam, perhaps equivalent in age to the basal gravels of the Chingshui Erosion in North China—roughly the Eem-equivalent (Graham 1935, Teilhard 1935, 1941). Two examples are shown in Fig. 6a.

14. *Ch'ung-ching Municipality to western Szechuan* (Fig. 1.14)

Between Ch'ung-ch'ing Municipality and western Szechuan, on terraces of the Yangtze, Min, and Yalun, Edgar (1933/4) also reported collecting a large series of "paleoliths." The collection is said to derive from an area which has a loessic veneer capping the slopes; the deposits are disturbed. Although the loess dates to the Upper Pleistocene there is no assurance that the artifacts were not secondarily introduced (Bowles 1933, Edgar 1933/4, Graham 1935, Teilhard 1941).

15. *Fulin=Hanyüan* (Fig. 1.15: lat 29° 20' N, long 102° 40' E)

Reported recently from Fulin are nuclei, flakes, and several worked flakes in association with mammals in sandy loams of possible upper pleistocene age (Yang 1961). Three sites are reported, although the artifacts seem to come from just one, a station of loess-like outcroppings on the left bank of the Tatu. Also in the levels were diffuse ash, teeth of *Ursus* cf. *thibetanus*, and shells of *Lancerolaria*.

A total of 163 pieces including three nuclei, fourteen "worked" flakes, and 149 nonutilized flakes were recovered from a 1 m² test pit, in a level 2.1–2.2 m below the surface. The cores are reported to have prepared platforms although the core shape appears to be irregular. Platform angles are near 90°. The English summary

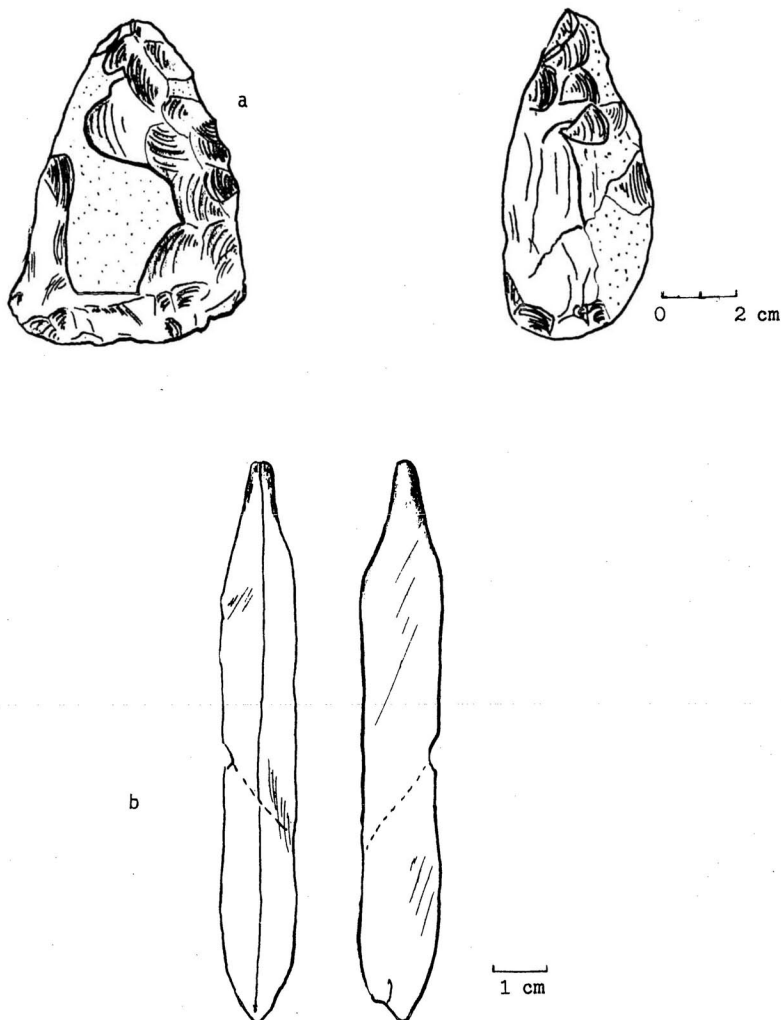


Fig. 6 Szechuan. *a*, Chungking area (from Teilhard 1941); *b*, Tzeyang awl.

to the report describes “blades” and a “blade” core but this is not typologically correct; small specimens are characteristic but do not include true blades punched from cores. Unfortunately, the illustrations of the material are poor; however, there is no evidence of retouch on any of the small flakes illustrated. Dating of the finds to the terminal Pleistocene is possible though tenuous.

16. *Tzeyang* (Fig. 1.16: lat $30^{\circ} 10' N$, long $104^{\circ} 40' E$)

A fossil human skull and a bone awl (Fig. 6*b*) were found near the Huanshanchi bridge, near Tzeyang, Nei-chiang District, in sandy loams (Chia 1954, Movius 1955, P'ei 1952, P'ei and Woo 1957). The locale is 80 km southeast of Chengtu and 0.5 km west of Tzeyang.

After authorities were notified of the find made by workmen beneath some 8 m of alluvial deposits, P'ei led a party in excavations at the site. Two large pits were

dug in 1951. The details of the stratigraphy in the area are well known but the exact *in situ* position of the skull is not confirmed. The deposits are:

- I. 6 m of yellowish-red "clay" similar to loess;
- II. dark gray clay with decayed material and fine sand lenses;
- III. 1-1.5 m of yellowish sands and small pebbles; included are the remains of large trees, with roots, leaves, and branches recognizable, lying horizontally with the roots to the northwest. The trunks are carbonized and have been identified as oak and walnut. The skull may derive from this level. At the base of the zone, sands are coarser and pebbles larger, fossils increasingly broken and rolled, and trees rare;
- IV. a sterile layer of increasingly large pebbles and finer sands.

P'ei believes that during the Middle Pleistocene the Huanshanchi was a torrential river which formed the gravel bed layer IV. During this period *Stegodon*, *Rusa*, and *Rhinoceros* were present. In the Upper Pleistocene the river meandered through the area, depositing the small pebbles and sands of layer III. Man, mammoth, and deer were included in the deposits at this time. P'ei believes that subsequently the river changed course and trees grew in the old river bed, only to be buried later when the river flooded (layer II). At the end of the Pleistocene the river, perhaps under the influence of a dry climate, deposited fine clays (layer I). Only recently has the river changed course and cut into the clays.

Fluorine and specific gravity tests run on the hominid and mammalian remains reveal two periods of deposition, as reconstructed by P'ei and Woo (Chiu 1955). *Panthera tigris*, the hyena, *Sus* sp., *Hystrix* sp., and *Rhizomys* could be present in both. The earlier group includes *Cervus* (*Rusa*) *unicolor* and *Stegodon orientalis*, and the later one has *Homo sapiens*, *Equus* sp., *Muntiacus reevesi*, ? *Moschus* sp., and *Mammuthus primigenius*. The degree of fossilization, coloration, and amount of rolling observed reinforces the division of the fauna.

The skull from Tzeyang is considered by Woo to be clearly *Homo sapiens*; Coon (1963) believes it is early and agrees it is somewhat older than the Upper Cave remains. Endocranial suture closure and features of the skull led Woo to consider the skull to be that of a middle-aged female. Ch'in (1962) restudied the remains, aged it at forty to fifty years, rather than over fifty, and did not find sufficient information to sex it.

Primitive features of the skull include prominent supraorbital ridges, the position of the bregma, flattened frontal and parietals, thick squamous, tympanic, and mastoid part of the temporal, and small temporal squama. In addition, the position of the zygomatic process, well-developed to massive mastoid process and supramastoid crest, simple middle-anterior positions of the lambdoid suture, well-developed sagittal keel, deep mandibular fossa, developed articular tubercle, and absence of the post-glenoid process are also considered primitive. The skull shows a thick tympanic plate around the external auditory meatus, thick and rough occipital plane of the occipital squama, shorter median sagittal arc than nuchal plane, occipital cerebral fossae larger and deeper than the cerebellar fossae, low frontal crest on the inner surface of the frontal, and other features which indicate its early position. The calvaria height and bregma position indices and bregma and frontal angles

suggest an antiquity greater than for the Upper Cave skulls. An absolute date between 20,000 and 35,000 years ago would probably be acceptable to P'ei and Woo.

Hupei Province

17. Ch'angyang (Fig. 1.17: lat 30° 10' N, long 111° E)

In the middle 1950s a fragment of human maxilla and some mammalian remains were collected from the Ichang limestone, in the Lungtung cave near Hsiachung-chiawan some 45 km southwest of Ch'angyang, I-chang District (Chia 1957). The deposits are reported as fine, dark yellow sandy clay with abundant limestone fragments and patches of breccia near the base. The hominid and mammalian remains come from the clay.

Key faunal forms for dating include *Homo* sp., *Cuon antiquus*, *Crocota crocuta ultima*, *Stegodon orientalis*, *Megatapirus augustus*, and *Rhinoceros sinensis*. A Middle Pleistocene age is suggested by the fauna and by the presence of the hominid, which is considered to be morphologically between *H. erectus* and *H. sapiens* and indicates a dating late in that period. (However, Kahlke [1961] suggests that the remains belong in the middle Upper Pleistocene, perhaps because of the suggested hominid morphology.)

The human fossils include a left maxillary fragment with P¹ and M¹, and an isolated left P₂; the posterior part behind the socket of M¹ is missing. The main fragment includes exactly half of the palate—roof and the sagittal line from the nasal spine to the tooth line. According to Chia, the alveolar part is nearly orthognathus. Features which appear rather modern are the weak anterior nasal spine, which faces forward, the anterior wall of the sinus maxillaris, which extends forward beyond P¹, the rugged palatal surface, and the incisive foramen, which is close to the alveolar margin. So-called primitive features include the relatively wide lower part of the nasal aperture and its lateral wall, which is rather less curved than in modern man, and the strong canine eminence, which extends upward beyond the nasal floor, indicating a well-developed canine root. Tooth size is considered to be intermediate between that of *Homo erectus* and modern Chinese, although the root of P₂ is longer than either of the two corresponding *Homo erectus* teeth in the Choukoutien series. The enamel is wrinkled.

Chia also provides metrical details on the teeth (Table 1). The crown and roots of P₂ are larger and more complex than in modern man but smaller and simpler than in *Homo erectus*.

TABLE 1
TOOTH MEASUREMENTS IN LUNGTUNG HOMINID

TOOTH	HEIGHT	LENGTH	BREADTH
P ¹ crown	—	7.4*	10.6
M ¹ crown	—	10.8	12.8
P ₂ crown	4.8	8.3	10.6
P ₂ root	20.5†	7.2	9.8

* Measurements in mm.

† Cf. measurements of 17.3 and 19.2 in Choukoutien 1 *Homo erectus*.

Coon (1963) is in basic agreement with Chia's interpretation of the human remains. He sees them as morphologically and metrically similar to, but clearly more modern than, *Homo erectus* from Choukoutien.

Kiangsi Province

18. Yungshan (Fig. 1.18: lat 29° 20' N, long 117° 10' E)

Huang and Chi (1963a) reported a collection of mammals from Yungshan cave, 36 km north of Loping in northeastern Kiangsi, at the border of Shang-jao District and Ching-te-chen Municipality. There is an apparent association of flakes with the mammals in the "yellow deposits" beneath breccia. The breccia is composed of angular limestone fragments and of shale and quartzite. The yellow deposits are capped by a hard travertine crust, and in turn overlay red clay. The cave itself is 200-m long and stands 100 to 120 m above the present river level. The cave entrance is 9 m high and 15 m across, with deposits at the cave entrance some 2.5 to 3 m deep.

Other caves in the district appear in three altitudinal zones—less than 10 m from the river level, 40 to 50 m above, and 100 to 120 m above the river. The collapse of large limestone blocks and stalactites from the roofs of many caves may be associated with fluctuating climate. The faunal remains from these caves are similar to those found in the "yellow deposits" of Kwangtung and Kwangsi, evidently dating to the Middle Pleistocene. Some of the forms are *Hystrix*, *Rattus rattus*, *Stegodon* sp., *Rhinoceros* sp., *Rusa* sp., Bovidae cf. *Bubalus* sp., and Ovinae.

The article pictures only one flake from the cave. Dating may be Middle or late Middle Pleistocene on the basis of the fauna, making these among the earliest known artifacts from South China.

Hsienjentung (see remarks above under Kwangsi Province).

Anhui Province

19. Hsiaotsaowan (Fig. 1.19)

Woo and Chia (1955) mention a fragmental hominid femur found at Hsiaotsaowan, probably Ssu-hsien District, in northern Anhui. The femur and a Middle Pleistocene fauna were collected both from the surface and *in situ*. The fluorine test run by Chiu (1955) on the remains indicates that the femur is not associated with the other mammal bones. The fluorine content of the fauna is 2.38 to 2.95 percent compared to only 0.30 percent in the femur. Whether the femur is pre-Holocene is not known.

DISCUSSION

We might expect that the South China archaeological remains will prove most similar to those from immediately adjacent regions, including Burma and other parts of Southeast Asia (Table 2). In fact this does not seem so simply the case. The oldest Burmese industry, the Early Anyathian of the Middle Pleistocene, contains 84 percent heavy "hand-adze" tools (Movius 1944); none of the earliest known South China assemblages, which would be contemporaneous, have notable heavy tool components. The Late Anyathian of Burma is perhaps temporally closer to the Chinese remains but closely resembles the Early Anyathian, although it is typologically more advanced.

TABLE 2. RELATIVE SEQUENCE OF SOUTH CHINESE HOMINID LOCALITIES AND CULTURAL STATIONS

HOMINIDS			CULTURAL REMAINS						AGE-EQUIVALENTS
S. China	N. China	S.E. Asia	<i>Flake industries</i>			<i>pebble industries</i>		"artifacts"	
			S. China	N. China	S.E. Asia	S. China	S.E. Asia	S. China	
Lingshan (9) Hsiaotsaowan (19) Lichianghsien (2)			Nanhai (11) Lichianghsien (2) Fulin (15)			Yapushan (8) Malangchi (8) Hsienjentung, etc. (5)	Hoabinhian	Lingshan (9) Ch'uipei (3)	"terminal"
Tzeyang (16) Laipin (7)	Upper Cave		Pap'an (1)					Tzeyang (16) Wanh sien (12a?) Edgar's (14?)	"maximum"
Liuchiang (6)		Palawan Niah			Palawan Niah				"pre-maximum"
		Solo		Ordos					ca. 40,000
				Tingts'un				Edgar's (13?)	100,000 Chingshui Erosion = Itu Loam
Mapa (10)			Yungshan (18) ? Chienhsi (4)				Patjitanian		150,000 Riss II
Ch'angyang (17)				Choukoutien 15				Wanh sien antler (12b)	Riss I/II
	Choukoutien 1		Yungshan (18)	Choukoutien 1 K'oho Choukoutien 1			Anyathian		Riss I 250,000
		Trinil <i>H. erectus</i>					Trinil tools?		Advance Stage 350,000 Holstein
	Lantian 63706	Djetis <i>H. erectus</i>		Lantian 63706					Mindel 500,000
									mid-Mosbachium = Mauerer Waldzeit 700,000

UPPER PLEISTOCENE

Late

Middle

Early

MIDDLE PLEISTOCENE

Late

Middle

Early

WU-M - EEM

RISS - HOLSTEIN - MINDEL - MOSBACHUM

The Patjitan site of Java is possibly contemporaneous with the earliest South China remains, covering the late Middle Pleistocene and later. However, Movius considers it typologically similar to the Burmese remains, although the heavy tool component at the site is reduced to only 40 percent. Flakes tend to be large, massive, and crudely worked, and, importantly, derived mainly by the dropping of blocks on nodules rather than by the striking off of a core. The huge Patjitan flakes, in contrast to the Chinese flakes, lack both the striking platform and bulb of percussion which characterizes the hammerstone technique of removing flakes from cores.

According to Müller-Beck (personal communication, 1966) the Southeast Asian industries in general are persistent through time in techniques of manufacture and basic typology. The older middle pleistocene traditions evidently continue into the Holocene and are phylogenetically related to the so-called mesolithic and neolithic Hoabinhian industries. The major trend in Southeast Asia is an increase in the number of flake tools of advanced form, reduction in artifact size, and an increased percentage of "end scraper" types.

From the terminal Pleistocene well into the Recent the Hoabinhian contains a fair proportion of crude implements along with unifacially worked quartzite pebbles and utilized quartzite flakes. At the end of the Pleistocene new elements begin to appear in the typical Hoabinhian assemblage—small flake knives, the quadrangular adze, grinding, and, evidently, cord-marked pottery and at least several cultigens (Gorman 1969). The Hoabinhian is apparently closely related to the so-called mesolithic of South China (Chang 1968), or rather the latter may be considered a regional variant of Hoabinhian.

In my opinion a general lack of typological sophistication links the East Asian industries of Southeast Asia, South China, and for that matter, North China—a poor basis for comparison to say the least. The South Chinese upland terrace and cave localities of the Middle and Upper Pleistocene, with the almost exclusively flake lithic remains, do not appear necessarily to be closely related to the Burmese and Javanese material. However, Solheim (1969) has recently synthesized the Island Southeast Asian discoveries. Utilized flake assemblages from western Palawan in the Philippines and Niah cave in Sarawak are found in datable pleistocene contexts associated with the remains of modern *Homo sapiens*. Absolute dating in excess of 30,000 years is assigned on the basis of present information, and Solheim hypothesizes a mainland derivation out of older pebble traditions at least 50,000 years ago. This is congruent with the South Chinese materials from cave localities which are essentially flake assemblages and which date perhaps two or three times older than Solheim initially suggested. Further study is needed to determine whether the South Chinese materials will conform to his suggested origin in Southeast Asian traditions, or ultimately prove to belong to North Chinese lithic traditions which from the outset seem to have stressed flake artifacts. At this time there is simply no way to measure the degree of phylogenetic or even phenetic similarity (typologically or over distance). The materials in question are poorly dated, lack archaeological context, and for the most part consist of undiagnostic tools and debris.

It is worth reiterating that newly discovered materials from South China that date to the Middle and Upper Pleistocene are all flake assemblages rather than pebble-tool collections. Furthermore, these flake assemblages tend to occur in the

western uplands, although not exclusively. The pebble-tool complexes in South China are found in subtropical cave contexts, usually but not always associated with edge-ground tools, crude ceramics, and abundant shellfish remains. It is worth considering that the two forms of lithic tradition in South China are temporally far removed and to some extent geographically removed from one another, and therefore perhaps are culturally disparate as well.

Furthermore, these probably terminal pleistocene and early holocene cave remains, principally in Kwangsi and Kwangtung, with their crude pottery, lithic characteristics, and obvious use of shellfish, are probably correctly viewed as part of the Hoabinhian technocomplex and riverine adaptation. Hsienjentung in Kiangsi, with its bone harpoons, abundant invertebrate remains, and mammals, considered by its finders as being early Holocene, may prove to be older; it certainly is important from the standpoint of indicating the areal spread of this human adaptive pattern in South China and Southeast Asia. It further suggests that the direction of diffusion of both ceramic and agricultural technology was from south to north in China, a topic outside the scope of this paper.

We are fortunate in having a number of fossil hominids from South China which record the development of modern Mongoloid *Homo sapiens* for that region, and in conjunction with North Chinese finds, for China in general (Aigner 1969, Aigner and Laughlin 1972). Because of the difficulty in seriating South Chinese faunas generally, and due to the lack of clear faunal and cultural associations for the hominids as well, the relative dating of the human fossils is tenuous, and is of necessity based partly on morphology and partly on comparison with absolutely dated materials from elsewhere in eastern Asia. The sequence is suggested in Table 3.

TABLE 3. SEQUENCE OF HOMINID FOSSILS IN
SOUTH CHINA DURING THE PLEISTOCENE

FOSSIL	AGE-EQUIVALENT	REMARKS
[Lantian 63706]	mid-Mosbachium	North Chinese, oldest member to date of the proposed Mongoloid phylogeny
[Choukoutien 1]	Holstein equivalent	North Chinese
Ch'angyang (Hupeh)	Riss I or later	described as representing an advanced form in the <i>H. erectus</i> grade of organization
Mapa (Kwangtung)	Riss II or later	represents the "neanderthaloid" or intermediate grade of organization; not a Neanderthal <i>sensu stricto</i>
Liukiang (Kwangsi)	mid-Wurm	represents a primitive form of <i>H. sapiens</i> (the Niah hominid may be 40,000 years old)
Laipin (Kwangsi)	late (pre-maximum) Wurm	considered to be an early form of <i>H. sapiens</i> , more advanced than Liukiang
Tzeyang (Szechuan)	late (pre-maximum) Wurm	considered an early form of <i>H. sapiens</i> , more primitive than Upper Cave hominids (see discussion above and Aigner 1969, 1972)
[Upper Cave]	just pre-maximum Wurm	North China

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Abbreviations

- APS *Acta Palaeontologica Sinica*, Peking.
 BGSC *Bulletin of the Geological Society of China*, Peking.
 CR *China Reconstructs*, Peking.
 IVPP Institute of Vertebrate Palaeontology and Palaeoanthropology, Peking.
 KKHP *K'ao-ku hsueh-pao*, Peking.
 SJA *Southwestern Journal of Anthropology*.
 VP *Vertebrata Palasiatica*, Peking.
 WW *Wenwu*, Peking.

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